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CREDIT RATIONING UNDER A DEREGULATED FINANCIAL SYSTEM: RURAL FINANCE IN THE PHILIPPINES

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Abstract

This study analyzed empirical data for evidence of credit rationing in rural financial markets of the Philippines. Quantity rationing of loans is widely practiced by rural banks, while outright loan rejection is prevalent in commercial and private development banks. Collateral is important in the rationing process, creating serious implications for land reform.

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I. Issues in Credit Rationing

One of the major objectives of financial reform in the Philippines is to enhance efficiency in financial intermediation and make access to credit easier for all types of borrowers. These changes are expected to bring about increased investments and higher productivity among economic units in the country. But the lifting of interest rate controls has to date failed to produce wide access to credit by farmers and rural households (Lamberte, 1989). Borrowers complain more about the lack of credit than about its price. It appears that banks exercise some degree of "credit rationing" by non-price mechanisms in an environment in which interest rates can be freely adjusted.

The recent literature on financial markets argues that interest rates fail to bring about equilibrium in markets with imperfect information (Bester, 1985; Cho, 1986; Jaffee and Russell, 1976; Stiglitz and Weiss, 1981). Even with flexible interest rates, the existence of imperfect information creates risk which induces credit rationing as rational, profit-maximizing behavior for banks. Credit rationing occurs when loan demand is higher than loan supply so that some borrowers receive no loans at all and others receive less than the amount applied for.

This study analyzes the rationing mechanisms used by banks in the rural

financial markets of the Philippines. The intensity and incidence of credit rationing are compared among bank types, and models are employed to test the factors expected to explain this rationing.

II. Conceptual Framework

Bank lending behavior can be divided into three stages: the screening stage, the acceptance/rejection rationing stage, and the quantity rationing stage. The screening of loan applicants is done by bank managers. Prior to filling out the loan application, applicants are informally interviewed to assess their creditworthiness and eligibility for credit. The quality of applicants encouraged or discouraged to submit formal applications will then affect the bank's risk exposure, as well as the degree of rationing that will occur after processing and evaluating the information found in the loan applications.

Formal rationing subsequently occurs in two stages. The decision to accept or reject the loan is made when enough information has been gathered about the applicant to indicate the expected profitability of granting him a loan. If the applicant is generally acceptable, the second stage of quantity rationing occurs when the actual loan amount is established. Generally, the bank restricts the loan size on the basis of a combination of factors such as probability of repayment, interest rate, the marginal cost of loan disbursement, and collateral offered.

These three stages of lending behavior can be formally analyzed within a framework where asymmetric information and its ensuing risk implications make

credit rationing a rational profit maximizing behavior by banks. Rationing occurs through lending behavior that considers the interest rate (r), the ratio of collateral to loan amount ($^{C}/_{L}$), the decision to lend and how much to lend, all of which are captured in α, the rationing parameter. This parameter is defined as the ratio of the amount received to the amount applied for. Choice of the optimal combination of α, r, and $^{C}/_{L}$ is affected by the lender's assessment of the probability of repayment (p), which is exogenously determined and can only be estimated using proxy variables, e.g., observable characteristics of the borrowers. The higher is p, the higher the chosen α, implying a lesser probability of being rationed. Also the higher is p, the lower is either r or $^{C}/_{L}$. This relationship is formally stated as $\alpha = f(r, {}^{C}/_{L}, p)$ where $p = g(x)$ and x is a vector of observable borrower characteristics such as asset position, capacity to pay, nature of investment, type of collateral, and previous repayment record, among others. Note the implied simultaneity between α and r, assuming $^{C}/_{L}$ is fixed, due to the effect of p. At the optimum, the bank chooses an α^*, which is based on the combined effects of r, $^{C}/_{L}$, and p and is indicative of the bank's rationing behavior.

III. The Screening and Rationing Behavior of Banks

The data used in this study were collected from 65 banks of which 22 were rural banks (RBs), 16 were private development banks (PDBs), and 27 were branches of four commercial banks (KBs), randomly chosen from eight provinces in the Philippines and refer to 1986 banking operations. The data were collected as

part of a comparative bank study jointly undertaken by the Philippine Institute for Development Studies and the Agricultural Credit Policy Council.

Analysis of the survey results showed that credit rationing exists in rural financial markets in the Philippines and that there are differences in the rationing behavior of the three bank types. One significant result is that the screening and acceptance/rejection rationing behavior of branches of KBs and PDBs were more restrictive than those for RBs. Only 58 and 60 applicants out of every 100 were invited to fill out loan applications in KBs and PDBs, respectively, while as many as 90 out of 100 were invited to do so in RBs. In the formal processing stage (i.e., acceptance and rejection), results indicated a slightly higher degree of rationing: a lower approval rate for KBs and PDBs than for RBs. The greater incidence of screening and loan rejection for KBs and PDBs may likely grow out of their relative bias for greater prudence and risk aversion combined with less desire to engage in rural lending compared to other banking activities.

The results also indicated that the rationing behavior of the three types of banks is influenced by factors such as the capacity to pay, the bank-client relationship, and collateral. RBs exhibit a strong bias towards a well-developed bank-client relationship in their rationing behavior as shown by the high ratio (81 percent) of repeat borrowers among those granted loans in 1986, compared with KBs (58 percent) and PDBs (54 percent).

These results are corroborated by the analysis of data obtained from a sample

of 344 bank client profiles of those granted loans in 1986 from PDBs and RBs. These loans present evidence on quantity rationing, the third and final stage of the rationing process.[1] The data on quantity rationing for PDBs and RBs strongly suggest that the degree of quantity rationing, measured by the ratio of loan granted to loan applied for, is minimal for all borrowers of PDBs and RBs. This is consistent with the screening and rationing behavior of the 65 banks in which it was found that the rejection rate is highest at the screening stage when the manager is the major decision-maker. In most cases, the loan amount applied for is discussed and agreed upon by both the manager and the borrower during this informal screening stage, so that the borrower is almost certain of getting the loan amount requested in the application. Quantity rationing would then take place only when the bank discovers additional characteristics of the borrower, e.g., loan delinquency with other banks, that would require such action.

IV. A Test for the Intensity and Incidence of Quantity Rationing

There are two ways of testing for quantity rationing: intensity or degree of quantity rationing and incidence or likelihood that a borrower is quantity-rationed. The test for intensity of quantity rationing determines what factors significantly affect the bank's decision to quantity-ration, i.e., reduce the loan amount granted, and how much quantity-rationing is done. The test for incidence of quantity rationing predicts

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1 A sample of loans from KBs could not be obtained due to limitations on access to client-based bank records.

whether the borrower will be quantity-rationed or not based on some factors observed by the bank.

Two types of models are estimated to account for these tests using data from 344 randomly selected client profiles of those granted loans in 1986 from RBs and PDBs. The quantity-rationing model testing for the intensity of rationing is:

$$\text{Log } {}^{L}/_{A} = f(\log \text{INT}, \log \text{COLL}, \text{AREA}, \log \text{INC}, \log \text{MAT}, \log \text{CL}, \text{DEP DEL}, \text{CCROP}, \text{BANK})$$

where ${}^{L}/_{A}$ = ratio of loan amount granted to loan amount applied for,

INT = effective interest rate,

COLL = market value of the collateral offered to secure the loan,

AREA = area of land owned,

INC = value of total income for the year,

MAT = maturity of the loan in number of months,

CL = ratio of collateral value to loan amount granted,

DEP = number of dependents,

DEL = dummy variable for delinquency record:

1 for borrower with delinquency record,

0 otherwise,

CCROP = dummy variable for cash crops:

1 for cash crops,

0 otherwise,

BANK = dummy variable for bank type:

1 for PDBs,

0 for RBs.

A two-stage least squares method was used to estimate the parameters of the model to account for the simultaneity between the interest rate, INT, and the rationing parameter $\alpha = {}^{L}/_{A}$.

The qualitative-response model, on the other hand, predicts the probability of a borrower being quantity-rationed and is of the form:

$$\theta i = \theta(\alpha_i = 1) = f(r, {}^{C}/_{L}, p),\ p = g(Xi, i=1,...,n)$$

where $\alpha_i = 1$ if $\alpha < 1$ or $L < A$

0 if $\alpha = 1$ or $L = A$

This model uses the same explanatory variables as the quantity-rationing model and was estimated using the logit method. Since all the variables included in these models are data routinely collected by the banks, the models represent a test of the factors the banks presumably use in making loan allocation decisions.

The best-fit estimates for the two models are presented in Tables 1 and 2. Separate equations were estimated per bank type because the bank type dummy variable test yielded a significant result, implying that PDBs behave differently from RBs regarding quantity rationing (see Lapar, 1988 for details of tests).

The first model suggests that interest rate, area of land owned, length of loan, number of dependents, and cash crop production significantly explain the intensity

of quantity rationing by RBs. As interest rates rise, or land area increases, or number of dependents rise, there is significantly less rationing in RBs (i.e., the ratio $^{L}/_{A}$ rises). On the other hand, as the loan maturity lengthens and/or cash crops are financed (coffee, cassava, coconuts, sugar), the more severe is the quantity rationing in RBs. For PDBs, rationing increases with increases in length of loan and number of dependents, while it decreases with higher collateral-to-loan ratios. Both RBs and PDBs tend to ration borrowers of long-term loans. RBs ration borrowers investing in cash crops more than non-cash crops, while PDBs ration borrowers with lower collateral-to-loan ratios and larger family size.

The second model results reported in Table 2 explain the probability of a borrower being rationed. For RBs, the probability of rationing decreases with increases in interest rate, collateral, farm size, and number of dependents, but increases with length of loan. For PDBs, the probability of rationing increases with income and loan maturity. The interest rate variable is insignificant. This is consistent with the known practice of PDBs to require reasonably well-off borrowers to participate in long-term loan financing through larger equity contributions, thereby making borrowers who have the capacity to pay to share a larger part of the risk of their investment financing.

It should be noted that PDBs engage in far more restrictive initial rationing behavior than RBs (i.e., during the informal screening stage and the first formal rationing stage of approval/rejection), and hence appear to be more risk averse in

their rural lending activity. In the third stage of quantity rationing for loans already approved, RB rationing behavior emerges strongly as seen in Tables 1 and 2. Thus, during the first two stages of this three-stage sequence, RB managers, relatively speaking, are much less likely to engage in screening and rationing behavior that implies outright rejection. However, once the loan application has been approved in principle, RB managers engage in more intense quantity rationing.

V. Conclusions and Policy Implications

Survey results have established empirical support for credit rationing in the rural financial markets of the Philippines and confirmed the theoretical argument that credit rationing can prevail in a deregulated financial system characterized by imperfect information. In the Philippines, this imperfect market for information was reinforced by the growing risks of financial activity in the recessionary environment of the 1980s.

Banks were observed to engage in an informal initial screening of potential borrowers usually carried out by the bank manager. This screening activity was widely practiced by KBs and PDBs. The relatively higher incidence of this screening behavior in these two bank types implies a more restrictive criteria for accepting loan applicants compared to RBs. These results seem to confirm the widely held view that KBs and PDBs are more risk averse and less committed to rural lending than RBs.

In the subsequent stages of loan processing, two types of credit rationing were

observed: strong credit rationing entailing outright rejection and weak credit rationing wherein the borrower was not rejected but given a loan less than the amount requested. The incidence of strong credit rationing was higher in PDBs and KBs than in RBs, while RBs engaged in significant quantity rationing.

The results of this survey suggest that even in a regime of market-oriented interest rates small and marginal borrowers will experience restricted access to loans due to risk considerations from imperfect information. Alternative solutions besides deregulated interest rates have to be devised to minimize these constraints. Measures that help to reduce risks and information costs may have to be initiated, e.g., setting up a roster of "good" small farmer clientele for banks by NGOs or PVOs, or improving the guarantee programs that are designed for these types of borrowers. Rural credit unions may also become a more important type of institution to serve this marginal clientele.

Finally, loan collateral is an important determinant of rationing behavior with land mortgages being the most important form of collateral accepted by these banks. The lack of clear land title for prospective land reform beneficiaries in the Philippines could seriously restrict their future access to loans from the formal banking system. This potential for negative externalities through the financial system needs to be taken into account as the country designs measures to implement land reform.

Table 1
Estimates of the Effect of Loan Terms and Observable Characteristics of Borrowers on Intensity of Rationing, By Type of Bank

Variable	PDBs	RBs
CONSTANT	0.907	-0.245
	(1.636)	(-0.477)
Log INT	-0.111	0.244
	(-1.144)	(2.669)*
AREA	-----	0.004
		(2.191)**
Log INC	-0.030	-0.014
	(-1.092)	(-0.448)
Log MAT	-0.118	-0.214
	(-3.428)*	(-2.662)*
Log CL	0.148	-0.039
	(2.953)*	(-1.258)
DEP	-0.034	0.028
	(-1.862)***	(2.570)**
CCROP	-----	-0.386
		(-5.288)*
R^2	0.347	0.254
F-Stat	5.564*	6.794*
N	44	120

Note: Dependent Variable = $\text{Log}(^{L}/_{A})$

* Significant at 1 percent.
** Significant at 5 percent.
*** Significant at 10 percent.

Table 2
Estimates of the Effect of Loan Terms and Observable Characteristics of Borrowers on the Incidence of Rationing, by Type of Bank

Variable	PDBs	RBs
CONSTANT	-55.001	3.836
	(-2.100)**	(0.497)
Log INT	-8.809	-5.661
	(-1.317)	(-3.282)*
Log COLL	-----	-0.344
		(-0.758)**
AREA	-----	-0.287
		(-2.453)**
Log INC	2.689	0.696
	(1.821)***	(1.020)
Log MAT	12.617	4.226
	(2.017)**	(2.313)**
Log CL	-----	0.712
		(1.216)
DEP	0.196	-0.311
	(0.592)	(-1.783)***
DEL	-----	1.544
		(1.180)
Log likelihood	-7.238	-29.995
Likelihood ratio	14.475	152.682*
N	54	120

Note: Dependent Variable = 1 if L < A
0 if L = A

* Significant at 1 percent.
** Significant at 5 percent.
*** Significant at 10 percent.

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